Specification amendments:

Replace the Summary of the Invention by

The present invention ~~is~~ provides a method for operating a data processing system to simulate a mixer having an RF port, a LO port, and an IF port. In the present invention, the signal leaving the IF port is approximated by the equation

$$b2 = f(a1, a3) + S22 * a2$$

where S22 is a constant, a2 is a signal input to the IF port, a1 is a signal input to said RF port and a3 is a signal input to said LO port, and

$$f(a1, a3) = \sum_{i=0}^{M} \sum_{j=0}^{N} C_{ij} * a1^i * a3^j$$

The coefficients C_{ij} are constants that depend on said mixer design. These coefficients can be determined by measuring the b2 when a1 and a3 are single tone signals. In addition, ~~The~~ the coefficients can be determined by simulating said mixer on a non-linear circuit simulator when a1 and a3 are single tone signals.

Paragraph starting at Page 2, line 23

~~Figure 2 shows the matrix [T] MxM for M=15.~~

Paragraph starting at page 2, line 28

The manner in which the present invention represents a mixer can be more easily understood with reference to Figure 1, which illustrates the signals associated with a mixer 100. In general, the mixer receives inputs a1 and a3, on the RF port 101 and the LO port 103. The mixer generates a signal b2 on the IF port 102 of the mixer. A circuit simulator must be able to compute the signals b1-b3 from the various input signals. The present invention models the relevant signals as follows:

$$b1 = S11 * a1$$
$$b2 = f(a1, a3) + S22 * a2$$
$$b3 = S33 * a3$$

where:

$$f(a1,a3)=\sum_{i=o}^{M}\sum_{j=o}^{N}C_{ij}*a1^{i}*a3^{j}. \qquad (1)$$

Here, S11, S22, and S33 are constants determined by a vector network analyzer measurement or by an S-parameter simulator.

Paragraph starting at page 3, line 14

Consider the case in which the incident waves at the RF port and the LO port are single sinusoidal tones, i.e.,

$$\begin{aligned} a1 &= A*\cos w_1 t \\ a3 &= B*\cos w_2 t \end{aligned} \qquad (2)$$

and there is no signal incident on the IF port. The output of the IF port generated by the present invention will be:

$$\begin{aligned}
&f(a1,a3)= \\
&a_{00}+a_{01}\cos(w_2t)+a_{02}\cos(2w_2t)+\ldots\ldots+a_{0N}\cos(Nw_2t)+ \\
&a_{10}\cos(w_1t)+a_{11}\cos(w_1\pm w_2t)+a_{12}\cos(w_1\pm 2w_2t)+\ldots\ldots+a_{1N}\cos(w_1\pm Nw_2t)+ \\
&a_{20}\cos(2w_1t)+a_{21}\cos(2w_1\pm w_2t)+a_{22}\cos(2w_1\pm 2w_2t)+\ldots\ldots+a_{2N}\cos(2w_1\pm Nw_2t)+ \\
&\ldots\ldots\ldots \\
&a_{M0}\cos(Mw_1t)+a_{M1}\cos(Mw_1\pm w_2t)+a_{M2}\cos(Mw_1\pm 2w_2t)+\ldots\ldots+a_{MN}\cos(Mw_1\pm Nw_2t)
\end{aligned} \qquad (3)$$

It can be seen from this expansion, that the present invention models the mixing products generated by the mixer at all frequencies $m*RF+n*LO$ with $(-M\le m\le M,-N\le n\le N)$. Here, the a_{ij} are entries in the conventional IMT. That is, each coefficient represents the voltage-wave magnitude that determines the actual output power level of a mixing product, under a particular set of input frequency and power conditions. The coefficients a_{ij} can be measured for any given mixer design using a spectrum analyzer.

Paragraph on page 4, starting at line 12

To determine the model coefficients $C_{ij}(i=0...M, j=0,...N)$ from the IMT, one needs to solve following algebra equation:

$$[F]_{KxK}\,[C]_{Kx1} = [a]_{Kx1}$$

with $K=(M+1)*(N+1)$,

$$C_k = C_{ij},$$

$$a_k = a_{ij},$$

$$k = i + j*(N+1),\ 0\leq i\leq M,\ 0\leq j\leq N$$

Here, a_{ij} is the ij^{th} entry of the mixer IMT data matrix. $[F]$ is the coefficient matrix. $[F]$ may be computed from a characteristic matrix $[T]_{MxM}$ as follows. For most practical mixer applications, M=15 is sufficient. ~~The matrix [T] MxM for M=15 is shown in Figure 2.~~

Paragraph beginning on page 5, line 4

The above example assumes that the inputs to the RF and LO inputs are single tones. However, the present invention can also be utilized with more complex input signals such as modulation signals. In this case, a1 and a3 will be more complex time domain signals rather than sinusoidal signals.

Replace the Abstract by

A method for operating a data processing system to simulate a mixer having an RF port, a LO port, and an IF port. In the present invention, the signal leaving the IF port is approximated by :

$$b2 = f(a1, a3) + S22 * a2$$

where S22 is a constant, a2 is a signal input to the IF port, a1 is a signal input to said RF port and a3 is a signal input to said LO port, and

$$f(a1, a3) = \sum_{i=0}^{M}\sum_{j=0}^{N} C_{ij} * a1^i * a3^j$$

The coefficients C_{ij} are constants that depend on said mixer design. These coefficients can be determined by measuring the b2 when a1 and a3 are single tone signals. In addition, ~~The~~ the

coefficients can be determined by simulating said mixer on a non-linear circuit simulator when a1 and a3 are single tone signals.

In the drawings

Delete Figure 2.